Scientists are fighting to save the banana

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Don't take those cheap yellow fruits for granted! They're at the center of a great agricultural turmoil.

Bananas may go for dirt-cheap prices at the grocery store, but behind the scenes investors are flinging millions of dollars at the industry in an effort to save our favorite fruit. The plain yellow banana known as the Cavendish variety that is most commonly found in North American and European supermarkets is at risk of extinction, thanks to a virulent disease that has ravaged crops in Africa, Asia, Australia, and parts of the Middle East in recent years.

The disease goes by several names -- 'fusarium wilt,' Panama disease, and Tropical Race 4 are a few of its monikers -- and experts are very concerned that it's only a matter of time till it spreads to Latin America, where the vast majority of the world's bananas are grown. The Cavendish accounts for 99.9 percent of all bananas traded globally, and it already has replaced a different and allegedly tastier variety called Gros Michel that was wiped out in the 1960s and '70s following a similar fungal outbreak.

A number of biotech companies and researchers have jumped at the opportunity to create a fungal-

resistant variety of banana. Tropic Biosciences is one such company. It has just received $10 million from investors and is using gene-editing techniques to make the Cavendish more resilient. *The Guardian* reports that Tropic Biosciences "has already conducted successful gene editing on a banana cell which can be grown into a full plant." The company's chief scientific officer, Eyal Maori, said:

"It is not just about disease resistance but also about easing the environmental burden. The new variety will mean the need for less fungicides and higher yields for farmers. The trials should show the plants can perform well in real world conditions and demonstrate value to the growers."

Similar projects are underway elsewhere. Queensland University in Brisbane has been successful in transferring genes from a disease-resistant wild banana to the Cavendish, but is currently undergoing multi-year trials to see how it works over the long term. Other researchers are doing similar work in Israel and Ecuador.

The USDA's Tropical Agriculture Research Center, based in Puerto Rico, is experimenting with wild varieties of bananas to see which can resist the fusarium wilt. As of 2016 only 10 percent had passed the test; but even when these are found, being wild varieties, they come with so many seeds that it's difficult to eat the pulp. This requires further cross-breeding, as described by NPR:

"There's a special complication when breeding bananas. Breeders have to start with bananas that have seeds; otherwise, there are no offspring. But eventually their efforts have to produce a variety with no seeds, so that people will eat it. It can be done, and in the best of all worlds, this breeding effort would come up with multiple varieties, not just one."

The BananEx Project out of Exeter University in England is led by Dan Bebber. He described the different projects to *The Guardian*: "What we are seeing is gene editing versus gene modification with gene editing working with the existing DNA and gene modification adding in DNA of different organisms."

But Bebber is concerned that, no matter what genetic tweaking occurs, we need to be looking at the broader picture. What we need is an agricultural industry that is not dominated by mono-crops, that has greater diversity, healthier soil systems that can naturally combat pathogens, and better biological pest and disease controls.

The banana industry has not learned its lesson from the Gros Michel disaster, apparently, which is why we are facing a similar wipeout. As shoppers, in the meantime, we can do our part by buying unfamiliar varieties of bananas when we encounter them and opting for organic, which is kinder on the land and farm workers. I'll leave the last word to a commenter on a *Washington Post* article from last year called "Bananapocalypse":

This is "an object lesson in the danger of mono-culture farming, whatever the ostensible benefits of the specific cultivar. This story should be a reference point for those who snort at efforts to preserve heritage breeds and seeds."